PATENT

IN THE CLAIMS:

Please find a listing of the claims below. The statuses of the claims are shown in parentheses.

1. (Currently amended) An image enhancement method using face detection algorithms, comprising:

automatically detecting human faces in an image using face detection algorithms;

automatically locating the human faces in the image;

~~automatically measuring at least one of lightness levels, contrast levels, and color levels of the human faces; and~~

automatically enhancing an appearance of the image ~~based on the measured at least one of the lightness levels, contrast levels, and color levels of the human faces in the image by changing at least one of the lightness levels, contrast levels, and color levels of the image~~ by using a mapping technique to produce the image with target levels for a mean value or a variation value of the pixels in the human faces.

2. (Original) The method of claim 1, wherein the enhancing step includes automatically enhancing lightness levels of the human faces.

3. (Original) The method of claim 1, wherein the enhancing step includes automatically enhancing contrast levels of the human faces.

4. (Original) The method of claim 1, wherein the enhancing step includes automatically enhancing color levels of the human faces.

2

PATENT

5. (Canceled).

6. (Previously Presented) The method of claim 27, wherein the enhancing step comprises:

reducing or removing the red eye artifact from the human faces.

7. (Canceled)

8. (Currently amended) An apparatus for enhancing an image using face detection algorithms, comprising:

a module for automatically detecting human faces in an image using face detection algorithms;

a module for automatically locating the human faces in the image;

a~module-for-measuring-at-least-one-of-lightness-levels,-contrast-levels,-and-color levels-of-the-human-faces;-and

a module for automatically enhancing an appearance of the image-based-on-the measured-at-least-one-of-the-lightness-levels,-contrast-levels,-and-color-levels-of-the-human faces-in-the-image-by-changing-at-least-one-of-the-lightness-levels,-contrast-levels,-and-color levels-of-the-image by using a mapping technique to produce the image with target levels for a mean value or a variation value of the pixels in the human faces.

9. (Original) The apparatus of claim 8, wherein the image is a digital image.

3

PATENT

10. (Original) The apparatus of claim 8, wherein the module for enhancing the appearances of the image includes a module for automatically enhancing lightness levels of the human faces.

11. (Original) The apparatus of claim 8, wherein the module for enhancing the appearances of the image includes a module for automatically enhancing contrast levels of the human faces.

12. (Original) The apparatus of claim 8, wherein the module for enhancing the appearances of the image includes a module for automatically enhancing color levels of the human faces.

13. (Canceled).

14. (Previously Presented) The apparatus of claim 28, wherein the module for enhancing the appearances of the image comprises:

a module for reducing or removing the red eye artifact from the human faces.

15. (Currently amended) A computer readable medium comprising instructions for image enhancement using face detection, the instructions comprising:

automatically detecting human faces in an image using face detection algorithms;

automatically locating the human faces in the image;

automatically measuring at least one of lightness levels, contrast levels, and color levels of the human faces; and

4

PATENT

automatically enhancing an appearance of the image ~~based-on-the-measured-at-least~~ ~~one-of-the-lightness-levels,-contrast-levels,-and-color-levels-of-the-human-faces-in-the-image~~ ~~by-changing-at-least-one-of-the-lightness-levels,-contrast-levels,-and-color-levels-of-the-image~~ by using a mapping technique to produce the image with target levels for a mean value or a variation value of the pixels in the human faces.

16. (Original) The computer readable medium of claim 15, wherein the instructions for enhancing the appearance of the image include automatically enhancing lightness levels of the human faces.

17. (Original) The computer readable medium of claim 15, wherein the instructions for enhancing the appearance of the image include automatically enhancing contrast levels of the human faces.

18. (Original) The computer readable medium of claim 15, wherein the instructions for enhancing the appearance of the image includes automatically enhancing color levels of the human faces.

19. (Canceled).

20. (Previously Presented) The computer readable medium of claim 29, wherein the instructions for enhancing the appearance of the image comprises:

reducing or removing the red eye artifact of the human faces.

PATENT

21. (Currently amended) A system for enhancing an image using face detection algorithms, said system comprising:

means for automatically detecting human faces in an image using face detection algorithms;

means for automatically locating the human faces in the image;

~~means for measuring at least one of lightness levels, contrast levels, and color levels of the human faces;~~ and

means for automatically enhancing an appearance of the image ~~based on the measured at least one of lightness levels, contrast levels, and color levels of the human faces in the image by changing at least one of the lightness levels, contrast levels, and color levels of the image~~ by using a mapping technique to produce the image with target levels for a mean value or a variation value of the pixels in the human faces.

Claims 22-24. (Canceled).

25. (Previously Presented) The system of claim 21, wherein the means for enhancing includes means for automatically locating eyes in the human faces and means for reducing or removing the red eye artifact from the human faces.

26. (Canceled)

27. (Previously Presented) The method of claim 1, wherein the locating step includes automatically locating eyes in the human faces.

6

PATENT

28. (Previously Presented) The apparatus of claim 8, wherein the module for locating the human faces includes a module for automatically locating eyes in the human faces.

29. (Previously Presented) The computer readable medium of claim 15, wherein the instructions for locating the human faces include automatically locating eyes in the human faces.

30. (New) The method of claim 1, wherein the enhancing step further comprises enhancing the image by one of adding and subtracting a fixed amount to a lightness component of each pixel in the human faces, wherein the fixed amount is selected to produce an output image with a target mean lightness level of the pixels (x) in the face region, and wherein the output image (y) is determined through the following equation,

$y = x + T$, where $T = m_t - m_x$, wherein m_x is the mean of x and T is a transformation that substantially ensures that the m_x is equivalent to an output image m_t.

31. (New) The method of claim 1, wherein the enhancing step further comprises enhancing the image by substantially ensuring that an output image (y) has a target standard deviation σ_t, wherein the output image (y) is determined through the following equation,

$y = Tx + (1 - T)m_x$, where $T = \sqrt{\dfrac{\sigma_t^2}{\sigma_x^2}}$, wherein x represents the face pixels in the image, m_x is the mean of x, σ_x is the standard deviation of the face pixels x, and T is a transformation that substantially ensures that the standard deviation σ_x is equivalent to the target standard deviation σ_t.

7